

Claims

What is claimed is:

1. A rechargeable battery, comprising:

a wound assembly of a positive electrode, a negative
5 electrode, and a separator interposed therebetween,
accommodated in a case together with electrolyte, the positive
and negative electrodes being respectively formed of a metal
substrate and an active material layer coated thereon and
including a strip-like conductive portion at one end along a
10 direction in which they are wound, said strip-like conductive
portion being formed of a bared edge portion of said metal
substrate, and current collectors being respectively welded to
said strip-like conductive portions of the electrodes, wherein
the metal substrate of at least one of said positive
15 electrode and negative electrode is made of metal foil, and
said strip-like conductive portion of one of said positive and
negative electrodes that uses metal foil is formed with a
porous metal layer at least on one side thereof.

2. The rechargeable battery according to claim 1, wherein
20 an edge part of said active material layer covers part of said
porous metal layer.

3. The rechargeable battery according to claim 1, wherein
said strip-like conductive portion and said porous metal layer
together have a thickness that is 20 to 100 % of the overall
25 thickness of the electrode including the metal substrate and

the active material layer.

4. The rechargeable battery according to claim 1, wherein the positive and negative electrodes include a bared edge portion of the metal substrate at one end along the winding direction opposite from said strip-like conductive portion, and said bared edge portion is formed with a porous metal layer coated thereon such as to be flush with said active material layer.

5. The rechargeable battery according to claim 1, wherein the metal foil is either one of nickel foil and nickel-plated iron foil and has a thickness of 10 to 60 μm .

6. The rechargeable battery according to claim 1, wherein the porous metal layer is a sintered metal layer including at least one metal powder selected from the group consisting of nickel powder, stainless steel powder, chromium powder, and copper powder.

7. The rechargeable battery according to claim 1, wherein the metal substrate is one of metal foil having a lath structure, metal foil having a punched structure, and metal sheet having a three-dimensional structure in which bulged strips are formed in rows along one direction and protruded alternately on both sides of the sheet.

8. A method for manufacturing a rechargeable battery, comprising:

applying a paste containing metal powder and a thickener

at least on one side of an edge portion at one end of a metal substrate, and drying and sintering said paste to form a porous metal layer thereon;

applying a paste containing an active material at least
5 on one side of said metal substrate where said porous metal layer has not been formed, and drying said paste to form an active material layer thereon, thereby obtaining an electrode;

forming a wound assembly of electrodes consisting of a positive electrode, a negative electrode, and a separator
10 interposed therebetween, at least one of said positive and negative electrodes being formed through the previous process steps;

welding a current collector to an end face of said positive and/or negative electrode at one end where said
15 porous metal layer has been formed;

accommodating said electrode assembly with said current collector welded thereto into a case together with electrolyte;

connecting said current collector to a sealing member;
20 and

sealing said case with said sealing member.

9. The method for manufacturing a rechargeable battery according to claim 8, wherein, in the step of forming said porous metal layer, said paste is applied at edge portions at
25 both ends of said metal substrate.

10. The method for manufacturing a rechargeable battery according to claim 8, wherein said metal powder is either one of metal particles having a mean particle diameter of 0.5 to 4.0 μm and metal particles having a chain-like three-
5 dimensional structure.